DEPARTMENT OF THE AIR FORCE
59TH MEDICAL WING (AETC)
JOINT BASE SAN ANTONIO - LACKLAND TEXAS

18 MAY 2016

MEMORANDUM FOR SGOED
ATTN: MAJ JOSEPH MADDRY

FROM: 59 MDW/SGVU

SUBJECT: Professional Presentation Approval

1. Your paper, entitled **Comparison of Hydroxocobalamin Versus Norepinephrine Versus Saline in a Swine Model of Severe Septic Shock** presented at/published to **SURF Conference, San Antonio, TX 20 May 2016** with MDWI 41-108, and has been assigned local file #**16203.**

2. Pertinent biographic information (name of author(s), title, etc.) has been entered into our computer file. Please advise us (by phone or mail) that your presentation was given. At that time, we will need the date (month, day and year) along with the location of your presentation. It is important to update this information so that we can provide quality support for you, your department, and the Medical Center commander. This information is used to document the scholarly activities of our professional staff and students, which is an essential component of Wilford Hall Ambulatory Surgical Center (WHASC) internship and residency programs.

3. Please know that if you are a Graduate Health Sciences Education student and your department has told you they cannot fund your publication, the 59th Clinical Research Division may pay for your basic journal publishing charges (to include costs for tables and black and white photos). We cannot pay for reprints. If you are 59 MDW staff member, we can forward your request for funds to the designated wing POC.

4. Congratulations, and thank you for your efforts and time. Your contributions are vital to the medical mission. We look forward to assisting you in your future publication/presentation efforts.

Linda Steel-Goodwin

LINDA STEEL-GOODWIN, Col, USAF, BSC
Director, Clinical Investigations & Research Support

PROCESSING OF PROFESSIONAL MEDICAL RESEARCH/TECHNICAL PUBLICATIONS/PRESENTATIONS

INSTRUCTIONS

USE ONLY THE MOST CURRENT 59 MDW FORM 3039 LOCATED ON AF E-PUBLISHING

1. The author must complete page two of this form:
   a. In Section 2, add the funding source for your study [e.g., 59 MDW CRD Graduate Health Sciences Education (GHSE) (SG5 O&M); SG5 R&D; Tri-Service Nursing Research Program (TSNRP); Defense Medical Research & Development Program (DMRDP); NIH; Congressionally Directed Medical Research Program (CDMRP) ; Grants; etc.]

   b. In Section 2, there may be funding available for journal costs, if your department is not paying for figures, tables or photographs for your publication. Please state "YES" or "NO" in Section 2 of the form, if you need publication funding support.

2. Print your name, rank/grade, sign and date the form in the author's signature block or use an electronic signature.

3. Attach a copy of the 59 MDW IRB or IACUC approval letter for the research related study. If this is a technical publication/presentation, state the type (e.g. case report, QA/QI study, program evaluation study, informational report/briefing, etc.) in the "Protocol Title" box.

4. Attach a copy of your abstract, paper, poster and other supporting documentation.

5. Save and forward, via email, the processing form and all supporting documentation to your unit commander, program director or immediate supervisor for review/approval.

6. On page 2, have either your unit commander, program director or immediate supervisor:
   a. Print their name, rank/grade, title; sign and date the form in the approving authority's signature block or use an electronic signature.

7. Submit your completed form and all supporting documentation to the CRD for processing (59crdpubspres@us.af.mil). If you have any questions or concerns, please contact the 59 CRD/ Publications and Presentations Section at 292-7141 for assistance.

8. The 59 CRD/Publications and Presentations Section will route the request form to clinical investigations, 502 ISG/JAC (Ethics Review) and Public Affairs (59 MDW/PA) for review and then forward you a final letter of approval or disapproval.

9. Once your manuscript, poster or presentation has been approved for a one-time public release, you may proceed with your publication or presentation submission activities, as stated on this form. **Note:** For each new release of medical research or technical information as a publication/presentation, a new 59 MDW Form 3039 must be submitted for review and approval.

10. If your manuscript is accepted for scientific publication, please contact the 59 CRD/Publications and Presentations Section at 292-7141. This information is reported to the 59 MDW/CC. All medical research or technical information publications/presentations must be reported to the Defense Technical Information Center (DITC). See 59 MDWI 41-108, *Presentation and Publication of Medical and Technical Papers,* for additional information.

NOTE: All abstracts, papers, posters, etc., should contain the following disclaimer statement:
"The views expressed are those of the [author(s)] [presenter(s)] and do not reflect the official views or policy of the Department of Defense or its Components"

NOTE: All abstracts, papers, posters, etc., should contain the following disclaimer statement for research involving humans:
"The voluntary, fully informed consent of the subjects used in this research was obtained as required by 32 CFR 219 and DODI 3216.02_AFI 40-402."

NOTE: All abstracts, papers, posters, etc., should contain the following disclaimer statement for research involving animals, as required by AFMAN 40-401_IP :
"The experiments reported herein were conducted according to the principles set forth in the National Institute of Health Publication No. 80-23, Guide for the Care and Use of Laboratory Animals and the Animal Welfare Act of 1966, as amended."

PROCESSING OF PROFESSIONAL MEDICAL RESEARCH/TECHNICAL PUBLICATIONS/PRESENTATIONS

1. TO: CLINICAL RESEARCH	2. FROM: (Author's Name, Rank, Grade, Office Symbol)	3. GME/GHSE STUDENT:	4. PROTOCOL NUMBER:
	Joseph Maddry / Maj / O-4 / SGOED	☐ YES ☒ NO	FWH20130033A

5. PROTOCOL TITLE: (**NOTE:** For each new release of medical research or technical information as a publication/presentation, a new 59 MDW Form 3039 must be submitted for review and approval.)

Cobalamin as a treatment for battle associated severe sepsis-induced shock in swine (Sus Scrofa)

6. TITLE OF MATERIAL TO BE PUBLISHED OR PRESENTED:

Comparison of hydroxocobalamin versus norepinephrine versus saline in a Swine model of severe septic shock

7. FUNDING RECEIVED FOR THIS STUDY? ☒ YES ☐ NO FUNDING SOURCE: AFMSA

8. DO YOU NEED FUNDING SUPPORT FOR PUBLICATION PURPOSES: ☐ YES ☒ NO

9. IS THIS MATERIAL CLASSIFIED? ☐ YES ☒ NO

10. IS THIS MATERIAL SUBJECT TO ANY LEGAL RESTRICTIONS FOR PUBLICATION OR PRESENTATION THROUGH A COLLABORATIVE RESEARCH AND DEVELOPMENT AGREEMENT (CRADA), MATERIAL TRANSFER AGREEMENT (MTA), INTELLECTUAL PROPERTY RIGHTS AGREEMENT ETC.?
☐ YES ☒ NO **NOTE:** If the answer is YES then attach a copy of the Agreement to the Publications/Presentations Request Form.

11. MATERIAL IS FOR: ☒ DOMESTIC RELEASE ☐ FOREIGN RELEASE
CHECK APPROPRIATE BOX OR BOXES FOR APPROVAL WITH THIS REQUEST. ATTACH COPY OF MATERIAL TO BE PUBLISHED/PRESENTED.

☐ 11a. PUBLICATION/JOURNAL (List intended publication/journal.)

☐ 11b. PUBLISHED ABSTRACT (List intended journal.)

☒ 11c. POSTER (To be demonstrated at meeting: name of meeting, city, state, and date of meeting.)
SURF Conference, San Antonio, Tx, May 20, 2016

☐ 11d. PLATFORM PRESENTATION (At civilian institutions: name of meeting, state, and date of meting.)

☐ 11e. OTHER (Describe: name of meeting, city, state, and date of meeting.)

12. EXPECTED DATE WHEN YOU WILL NEED THE CRD TO SUBMIT YOUR CLEARED PRESENTATION/PUBLICATION TO DTIC
NOTE: All publications/presentations are required to be placed in the Defense Technical Information Center (DTIC).

DATE: September 01, 2016

13. 59 MDW PRIMARY POINT OF CONTACT (Last Name, First Name, M.I., email)	14. DUTY PHONE/PAGER NUMBER
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15. AUTHORSHIP AND CO-AUTHOR(S) List in the order they will appear in the manuscript.

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f.			

I CERTIFY ANY HUMAN OR ANIMAL RESEARCH RELATED STUDIES WERE APPROVED AND PERFORMED IN STRICT ACCORDANCE WITH 32 CFR 219, AFMAN 40-401_IP, AND 59 MDWI 41-108. I HAVE READ THE FINAL VERSION OF THE ATTACHED MATERIAL AND CERTIFY THAT IT IS AN ACCURATE MANUSCRIPT FOR PUBLICATION AND/OR PRESENTATION.

16. AUTHOR'S PRINTED NAME, RANK, GRADE	17. AUTHOR'S SIGNATURE	18. DATE
Joseph Maddry/ Maj / O-4	MADDRY.JOSEPH.K.1179113950 Digitally signed by MADDRY.JOSEPH.K.1179113950 Dn: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USAF, cn=MADDRY.JOSEPH.K.1179113950 Date: 2016.04.25 13:05:26 -05'00'	April 25, 2016
19. APPROVING AUTHORITY'S PRINTED NAME, RANK, TITLE	20. APPROVING AUTHORITY'S SIGNATURE	21. DATE
William C. Terry/GS13	TERRY.WILLIAM.CHRIS.11528890 93 Digitally signed by TERRY.WILLIAM.CHRIS.11528890 Dn: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USAF, cn=TERRY.WILLIAM.CHRIS.11528890 Date: 2016.05.09 13:54:40 -05'00'	9 May 2016

PROCESSING OF PROFESSIONAL MEDICAL RESEARCH/TECHNICAL PUBLICATIONS/PRESENTATIONS

1st ENDORSEMENT (59 MDW/SGVU Use Only)

TO: Clinical Research Division 59 MDW/CRD Contact 292-7141 for email instructions.	22. DATE RECEIVED 12 May 16	23. ASSIGNED PROCESSING REQUEST FILE NUMBER
24. DATE REVIEWED 12 May 16		25. DATE FORWARDED TO 502 ISG/JAC 12 May 16

26. AUTHOR CONTACTED FOR RECOMMENDED OR NECESSARY CHANGES: ☒ NO ☐ YES If yes, give date. _____ ☐ N/A

27. COMMENTS ☒ APPROVED ☐ DISAPPROVED

28. PRINTED NAME, RANK/GRADE, TITLE OF REVIEWER	29. REVIEWER SIGNATURE	30. DATE
Linda D Harris, GS 14, Chief, Operations Br	HARRIS.LINDA.DAWN.113189058 0	12 May 16

2nd ENDORSEMENT (502 ISG/JAC Use Only)

31. DATE RECEIVED	32. DATE FORWARDED TO 59 MDW/PA

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37. DATE RECEIVED May 16, 2016	38. DATE FORWARDED TO 59 MDW/SGVU May 17, 2016

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The abstract needs to include the standard disclaimer "The views expressed in this article are those of the author and do not necessarily reflect the official policy or position of the Air Force, the Department of Defense, or the U.S. Government." Once the disclaimer is added, the abstract is cleared for release.

40. PRINTED NAME, RANK/GRADE, TITLE OF REVIEWER	41. REVIEWER SIGNATURE	42. DATE
Christopher Carwile, TSgt/E-6, NCOIC, PA	CARWILE.CHRISTOPHER.STEW ART.1280477229	May 17, 2016

4th ENDORSEMENT (59 MDW/SGVU Use Only)

43. DATE RECEIVED	44. SENIOR AUTHOR NOTIFIED BY PHONE OF APPROVAL OR DISAPPROVAL ☐ YES ☐ NO ☐ COULD NOT BE REACHED ☐ LEFT MESSAGE

45. COMMENTS ☐ APPROVED ☐ DISAPPROVED

46. PRINTED NAME, RANK/GRADE, TITLE OF REVIEWER	47. REVIEWER SIGNATURE	48. DATE

Comparison of hydroxocbalamin versus norepinephrine versus saline in a swine model of severe septic shock.

Background: Sepsis is associated with a mortality of nearly 30%. Mortality is due, in part, to an uncontrolled inflammatory response. Matrix metalloproteinase-9 (MMP-9) and heat shock protein 70 (HSP 70) have been suggested to be biomarkers of severe sepsis and may be useful indicators of treatment success. Hydroxocobalamin (HOC), which regulates inducible nitric oxide synthase and increases systemic vascular resistance, may be effective in treating sepsis-induced hypotension and reversing overexpression of inducible nitric oxide synthase.

Objective: To compare efficacy of HOC versus norepinephrine (NOR) versus saline in swine with lipopolysaccharide (LPS)-induced endotoxemia.

Methods: Swine (45-55 kg) were anesthetized, intubated, and instrumented with continuous femoral and pulmonary artery pressure monitoring. Endotoxemic shock, defined as a 50% decrease in mean arterial pressure (MAP) compared to baseline, was established with a two hour escalating infusion of LPS (5-60 mcg/kg/hr) followed by a continuous infusion of LPS (20 mcg/kg/hr). MAP remained at 50% of baseline for one hour before treatment ensued. Animals received either 200 mg/kg bolus of HOC followed by a maintenance infusion of 15 mg/kg, NOR infusion titrated to maximize MAP and maintain HR ≤ 180 BPM, or saline (1.5 mg/kg/hr). A sample size of 10 animals per group was determined based on a power of 80% and an alpha of 0.05 to detect a difference between groups using repeated measures MANOVA.

Results: We previously reported that HOC and NOR were comparable in supporting MAP and significantly better than saline ($p<0.01$). We now report whereas MMP-9 or HSP 70 values were not significantly different at baseline between groups ($p=0.4$; 0.13), nor was there a difference between groups after two hours of LPS infusion ($p=0.5$ and 0.3), there was a significant within group difference such that LPS increased MMP-9 and HSP 70 over time ($p<0.01$; <0.01) prior to treatment. After treatment MMP-9 values fell significantly in the HOC group compared to the other groups ($p<0.02$) and HSP 70 decreased in the HOC and NOR groups compared to saline treatment ($p<0.05$)

Conclusions: An infusion of intravenous HOC appears to be comparable to NOR in decreasing biomarkers associated with severe LPS-induced endotoxemic shock and significantly better compared to saline in our experimental animal model.